and, in general, these vessels form a complete circuit. The first rudiments of a vascular organization are those observed and described by Tiedemann, in the *Asteriæ*, which are situated higher in the animal scale than Medusæ; but whether any actual circulation takes place in the channels constituted by these vessels, which communicate both with the cavity of the intestine, and with the respiratory organs, is not yet determined with any certainty. The *Holothuriæ*, which also belong to the order of Echinodermata, are furnished with a complex apparatus of vessels, of which the exact functions are still unknown. In those species of Entozoa which exhibit a vascular structure, the canals appear rather to be ramifications of the intestinal tube, than proper vessels, for no distinct circulation can be traced in them: an organization of this kind has already been noticed in *Tæniæ*.*

It was, till very lately, the prevailing opinion among naturalists that all true insects are nourished by imbibition, and that there exists in their system no real vascular circulation of juices. In all the animals belonging to this class, and in every stage of their development, there is found a tubular organ, called the *dorsal vessel*, extending the whole length of the back, and nearly of uniform diameter, except where it tapers at the two ends. It contains a fluid, which appears to be undulated backwards and forwards, by means of contractions and dilatations, occurring in succession in different parts of the tube; and it is also connected with transverse ligamentary bands, apparently containing muscular fibres, capable, by their action, of producing, or, at least, of influencing these pulsatory movements. An enlarged representation of the dorsal vessel of the *Melolontha vulgaris*, or common cockchaffer, isolated from its attachments, is given in Fig. 333, showing the series of dilatations (v, v, v) which it usually presents in its course; and in Fig. 334, the same vessel is exhibited in connexion with the ligamentary

* Page 64, in this volume, Fig. 247. The family of *Planariæ* present exceptions to this general rule: for many species possess a system of circulating vessels. See Dugès, Annales des Sciences Naturelles, xv. 161.